Subject card

Subject name and code	FINANCIAL AND INSURANCE MATHEMATICS, PG_00066473			
Field of study	Economic Analytics			
Date of commencement of studies	October 2024	Academic year of realisation of subject		2024/2025
Education level	first-cycle studies	Subject group		Obligatory subject group in the field of study
				Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery		at the university
Year of study	1	Language of instruction		Polish
Semester of study	2	ECTS credits		4.0
Learning profile	general academic profile	Assessment form		assessment
Conducting unit	Department of Finance -> Faculty of Management and Economics			
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ewa Mazurek-Krasodomska		
	Teachers	dr inż. Ewa Mazurek-Krasodomska		
		dr Piotr Kasprzak		

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	45	5.0	50.0	100

Subject objectives	Identifies mathematical concepts and tools used in finance, banking and insurance

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W02] Demonstrates advanced knowledge of methods and techniques related to the field of study in economic analytics to explain complex problems.	selects appropriate methods and mathematical techniques to analyse financial problems	[SW1] Assessment of factual knowledge
	[K6_U04] Develops logical solutions to complex or unstructured problems in processes conducted under conditions of uncertainty	analyzes the influence of various factors which influence the studied phenomenon, striving to obtain an optimal solution	[SU2] Assessment of ability to analyse information

Subject contents	Time value of money - introduction. Simple interest model (SIM), Capital Gains Tax. Compound interest model (CIM) with annual, sub-period and continuous capitalization. The calculation of the mathematical and commercial discount. Valuation of short-term securities. Real capital value, real interest rate. Annuities - without capitalization, with capitalization, equal, compatible and non-compatible. Valuation of long-term securities. Construction of the loan repayment schedule, APRC calculation. Property insurance - calculation of net and gross premium. Calculation of single and multiple premiums in life, endowment and mixed insurance.

Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Activity in the class and additional tasks	50.0%	20.0%
	2 Tests	60.0%	80.0%

Recommended reading	Basic literature	Podgórska, M., Klimkowska, J. (2022). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN. Redo, M., Prewysz-Kwinto, P. (2021). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN. Otto, W. (2015). Matematyka w ubezpieczeniach. Ubezpieczenia majątkowe. Warszawa: WNT. Błaszczyszyn, B., Rolski, T. (2018). Podstawy matematyki ubezpieczeń na życie. Warszawa: Wydawnictwo Naukowe PWN.
	Supplementary literature	Borowski, J., Golański, R., Kasprzyk, K., Melon, L., Pogórska, M. (2003). Matematyka finansowa: przykłady, zadania, testy, rozwiązania. Wałbrzych: Szkoła Główna Handlowa. Cegłowski, B., Podgórski, B. (2021). Finanse z arkuszem kalkulacyjnym. Warszawa: Wydawnictwo Naukowe PWN. Sobczyk, M. (2011). Matematyka finansowa: podstawy teoretyczne, przykłady, zadania. Warszawa: Agencja Wydawnicza Placet. Kellison, S. G. (2008). Theory of interest. New York: McGraw-Hill. Piasecki, K., Ronka-Chmielowiec W. (2011). Matematyka finansowa. Warszawa: C.H. Beck.
	eResources addresses	Adresy na platformie eNauczanie: 24/25 Matematyka finansowa i ubezpieczeniowa S - Moodle ID: 39691 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39691
Example issues/ example questions/ tasks being completed	Calculation of the time value of money. Calculation of the future value of investments. APRC calculation. Calculation of premiums in property and life insurance.	
Work placement	Not applicable	

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